Listing of the Claims

This listing of claims will replace all prior versions, and listings of claims in the application.[1]

1. (previously presented) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

a. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 908 in SEQ ID NO:5;

b. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 859 in SEQ ID NO:6;

c. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 912 in SEQ ID NO:7;

d. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 853 in SEQ ID NO:8;

e. a polynucleotide sequence that is at least 90% identical to the polynucleotide sequence of (a), (b), (c) or (d) encoding a polypeptide; and

f. a polynucleotide sequence fully complementary to the polynucleotide sequence of (a), (b), (c), (d) or (e) encoding a polypeptide;

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[1] Since the Examiner indicated that the proposed claims amendments filed on December 6, 2006 would be entered for purposes of appeal (see Advisory Action, item #7), the claim listing below includes those amendments as having been entered.

wherein said polypeptide methylates DNA in an *in vitro* assay.

2. (canceled).

2 3. (original) A method of making a recombinant vector comprising inserting an isolated nucleic acid molecule of Claim 1 into a vector selected from a group consisting of:

a. a DNA vector; and

b. an RNA vector.

3 4. (original) A recombinant vector comprising the isolated nucleic acid molecule of Claim 1.

4 5. (original) A method of making ~~a~~ an isolated recombinant host cell comprising introducing the recombinant vector of Claim ~~4~~ 3 into a host cell.

5 6. (original) ~~A~~ An isolated recombinant host cell comprising the vector of Claim ~~4~~ 3.

6 7. (original) A method for producing a *de novo* DNA cytosine methyltransferase polypeptide, comprising culturing the recombinant host cell of Claim ~~6~~ 5 under conditions such that said polypeptide is expressed and recovering said polypeptide.

7
8. (previously presented) An isolated oligonucleotide probe or primer ~~comprising polynucleotides~~ selected from the group consisting of:

a. at least 50 contiguous nucleotides of SEQ ID NO:1, provided that said nucleotides are not AA052791(SEQ ID NO: 9); AA111043(SEQ ID NO:10); AA154890(SEQ ID NO:11); AA240794(SEQ ID NO:12); AA756653(SEQ ID NO:13); W58898(SEQ ID NO:14); W59299(SEQ ID NO:15); W91664(SEQ ID NO:16); W91665(SEQ ID NO:17); and

b. a nucleotide sequence fully complementary to ~~a~~ the nucleotide sequence in (a).

6
9. (previously presented) An isolated oligonucleotide probe or primer ~~comprising polynucleotides~~ selected from the group consisting of:

a. at least 30 contiguous nucleotides of SEQ ID NO:2, provided that said nucleotides are not AA116694 (SEQ ID NO:18); AA119979 (SEQ ID NO:19); AA177277 (SEQ ID NO:20); AA210568 (SEQ ID NO:21); AA399749 (SEQ ID NO:22); AA407106 (SEQ ID NO:23); AA575617 (SEQ ID NO:24); and

b. a nucleotide sequence fully complementary to ~~a~~ the nucleotide sequence in (a).

10-12. (canceled).

9
13. (previously presented) A method for *in vitro de novo* methylation of DNA, comprising:

a. contacting said DNA with a *de novo* DNA cytosine methyltransferase polypeptide encoded by the nucleic acid molecule of any of parts (a)-(e) of claim 1;

b. providing an appropriately buffered solution with substrate and cofactor; and

c. purifying said DNA.

14-24. (canceled).

10
25. (previously presented) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (a).

11
26. (previously presented) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (b).

12
27. (previously presented) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (c).

13
28. (previously presented) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (d).

14
29. (previously presented) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (e).

15
30. (previously presented) The nucleic acid molecule of claim 1, wherein said polynucleotide is that of part (f).

16
31. (previously presented) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

a. a polynucleotide sequence encoding mouse Dnmt3a polypeptide contained in ATCC Deposit No. 209933;

b. a polynucleotide sequence encoding mouse Dnmt3b polypeptide contained in ATCC Deposit No. 209934;

c. a polynucleotide sequence encoding human DNMT3A polypeptide contained in ATCC Deposit No. 98809;

d. a polynucleotide sequence encoding human DNMT3B polypeptide contained in ATCC Deposit No. 326637;

e. a polynucleotide sequence at least 90% identical to the polynucleotide sequence of (a), (b), (c) or (d) encoding a polypeptide; and

f. a polynucleotide sequence fully complementary to the polynucleotide sequence of (a), (b), (c), (d) or (e) encoding a polypeptide,

wherein said polypeptide methylates DNA in an *in vitro* assay.

17 16
~~32.~~ (previously presented) The nucleic acid molecule of claim ~~31~~, wherein said polynucleotide is that of part (a).

18 16
~~33.~~ (previously presented) The nucleic acid molecule of claim ~~31~~, wherein said polynucleotide is that of part (b).

19 16
~~34.~~ (previously presented) The nucleic acid molecule of claim ~~31~~, wherein said polynucleotide is that of part (c).

20 16
~~35.~~ (previously presented) The nucleic acid molecule of claim ~~31~~, wherein said polynucleotide is that of part (d).

21 16
~~36.~~ (previously presented) The nucleic acid molecule of claim ~~31~~, wherein said polynucleotide is that of part (e).

22 16
~~37.~~ (previously presented) The nucleic acid molecule of claim ~~31~~, wherein said polynucleotide is that of part (f).

23
~~38.~~ (previously presented) An isolated nucleic acid molecule comprising a polynucleotide at least 95% identical to a polynucleotide selected from the group consisting of:

a. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 908 in SEQ ID NO:5;

b. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 859 in SEQ ID NO:6;

c. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 912 in SEQ ID NO:7;

d. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 853 in SEQ ID NO:8; and

e. a polynucleotide sequence fully complementary to the polynucleotide sequence of (a), (b), (c) or (d), encoding a polypeptide

wherein said polypeptide methylates DNA in an *in vitro* assay.

24
39. (previously presented) The nucleic acid molecule of claim 23, wherein said polynucleotide is that of part (a).

25
40. (previously presented) The nucleic acid molecule of claim 23, wherein said polynucleotide is that of part (b).

26 41. (previously presented) The nucleic acid molecule of claim 23 38, wherein said polynucleotide is that of part (c).

27 42. (previously presented) The nucleic acid molecule of claim 23 38, wherein said polynucleotide is that of part (d).

28 43. (previously presented) The nucleic acid molecule of claim 23 38, wherein said polynucleotide is that of part (e).

29 44. (previously presented) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

a. SEQ ID NO:1;

b. SEQ ID NO:2;

c. SEQ ID NO:3;

d. SEQ ID NO:4;

e. a polynucleotide sequence that is at least 90% identical to the polynucleotide sequence of (a), (b), (c) or (d); and

f. a polynucleotide sequence fully complementary to the polynucleotide sequence of (a), (b), (c), (d) or (e),

wherein said polynucleotide of parts (a)-(e) encodes a polypeptide that methylates DNA in an *in vitro* assay.

30 ~~45.~~ (previously presented) The nucleic acid molecule of claim 29 ~~44~~, wherein said polynucleotide is that of part (a).

31 ~~46.~~ (previously presented) The nucleic acid molecule of claim 29 ~~44~~, wherein said polynucleotide is that of part (b).

32 ~~47.~~ (previously presented) The nucleic acid molecule of claim 29 ~~44~~, wherein said polynucleotide is that of part (c).

33 ~~48.~~ (previously presented) The nucleic acid molecule of claim 29 ~~44~~, wherein said polynucleotide is that of part (d).

34 ~~49.~~ (previously presented) The nucleic acid molecule of claim 29 ~~44~~, wherein said polynucleotide is that of part (e).

35 ~~50.~~ (previously presented) The nucleic acid molecule of claim 29 ~~44~~, wherein said polynucleotide is that of part (f).